OIPE
FEB 28 2002
PATENT & TRADEMARK OFFICE

#8/A
7-19-02

A34728 (071308.0249) M.C.
PATENT Not Entered

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	:	Büssert et al.
Serial No.	:	10/056,894
Filed	:	November 13, 2001
For	:	PROVISION OF PROJECT AND/OR PROJECT PLANNING DATA OF AN AUTOMATION PROJECT IN A FORMAT WHICH IS DEFINED BY A STANDARDIZED META LANGUAGE, IN PARTICULAR XML
Examiner	:	To Be Assigned
Group Art Unit	:	To Be Assigned

PRELIMINARY AMENDMENT

I hereby certify that this paper is being deposited with the United States Postal Service as in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

February 19, 2002
Date of Deposit

Bradley B. Geist
Attorney Name

Signature

27,551
PTO Registration No.

February 19, 2002
Date

Assistant Commissioner for Patents
Washington, D.C. 20231

NY02:371509.1

Sir:

Applicants respectfully request that the following amendments be entered in connection with the above-identified application.

IN THE SPECIFICATION:

N.E. Please replace the originally filed specification with the attached substitute specification. A "Version With Marked Changes Made" is submitted herewith.

IN THE CLAIMS:

Please amend originally filed claims 1-12 as follows:

1. --A device for converting data from a proprietary format in an automation project or component to a format defined by a standardized meta format, comprising a conversion apparatus, and further comprising means for converting the data with a defined format into project data and/or project planning data with a proprietary format, and means for providing the data with a defined format for further processing.

2. The device according to claim 1, further comprising an export/import apparatus.

3. The device according to claim 2, wherein the conversion device and the export/import apparatus are embodied in a single apparatus.

4. The device according to claim 1, further comprising a data storage apparatus for storing the data with a defined format.

5. An engineering system comprising the device according to claim 1.

6. A method for providing project data and/or project planning data from an automation project or component, comprising converting the project data and/or project planning data having a proprietary format into data with a format which is defined by a standardized meta language and which is made available for further processing.

7. The method according to claim 6, further comprising reading-in and processing the data with a defined format by at least one software program product or tool.

8. A method for providing project data and/or project planning data from an automation project or component, comprising generating by means of at least one computer program product or tool data in a proprietary format, and making this data available for further processing in a format which is defined by a standardized meta language.

9. The method according to claims 6 and 8, further comprising storing data having a defined format in a data storage apparatus.

10. The method according to claim 7, wherein the software program product or tool is selected from a version administration tool, a CAD, CAM, CAE program, a cam disk tool, a productivity program or a project design tool.

11. The method according to claim 7, further comprising exporting data with a defined format from the software program product or tool into a device according to claim 1.

12. The method according to claim 11, further comprising converting the data with a defined format into project data and/or project planning data having a proprietary format.--

REMARKS

The attached substitute specification contains no new matter as is apparent from the enclosed "Version With Marked Changes Made".

The amendments to the "Claims" are reflected in the attached "Version With Marked Changes Made."

Action on the merits is awaited.

Respectfully submitted,

Bradley B. Geist
Patent Office Reg. No. 27,551

Attorney for Applicants

BAKER BOTTS L.L.P.
30 Rockefeller Plaza
New York, NY 10112
(212) 408-2562

Version With Marked Changes Made

We Claim:

1. A device for ~~providing project data and/or project planning data of~~converting data from a proprietary format in an automation project or component~~, characterized~~ to a format defined by a standardized meta format, comprising a conversion apparatus, and further comprising means for converting the data with a defined format into project data and/or project planning data with a proprietary format ~~into data with a format which is defined by a standardized meta language, in particular XML, and for converting back data with a format which is defined by a standardized meta language, in particular XML, into project data and/or project planning data with a proprietary format and~~means for providing the data with a defined format for further processing.

2. The device ~~as claimed in~~according to claim 1, ~~characterized in that it contains~~further comprising an export/import apparatus ~~for exporting/importing data from the device and into it, respectively~~.

3. The device ~~as claimed in one of claims 1 or 2, characterized in that~~according to claim 2, wherein the conversion device and the export/import apparatus are embodied ~~as one~~in a single apparatus.

4. The device ~~as claimed in one of the preceding claims, characterized by~~according to claim 1, further comprising a data storage apparatus for storing the data with a defined format.

5. An engineering system ~~having~~comprising ~~a~~the device ~~as claimed in one of claims 1~~according to ~~4.~~claim 1.

6. A method for providing project data and/or project planning data ~~of~~from an automation project or component, ~~characterized in that~~comprising converting the project data and/or project planning data ~~with~~having a proprietary format ~~is converted~~ into data with a format which is defined by a standardized meta language~~, in particular XML,~~ and which is made available for further processing.

7. The method ~~as claimed in~~according to claim 6, ~~characterized~~ further comprising reading in ~~that~~and processing the data with a defined format ~~is read in and processed~~ by at least one software program product or tool.

8. A method for providing project data and/or project planning data ~~of~~from an automation project or component, ~~characterized in that at least one computer program product or tool generates project data and/or project planning data or such data is generated~~comprising generating by means of ~~said~~ at least one computer program product or tool data in a proprietary format, and making this data ~~is made~~ available for further processing in a

format which is defined by a standardized meta language~~, in particular XML~~.

9. The method ~~as claimed in one of~~according to claims 6 ~~to~~and 8, ~~characterized in that~~further comprising storing data ~~with~~having a defined format ~~is stored~~ in a data storage apparatus.

10. The method ~~as claimed in one of claims 7 to 9, characterized in that~~according to claim 7, wherein the ~~at least one~~ software program product or tool is selected from a version administration tool, a CAD, CAM, CAE program, a cam disk tool, a productivity program or a project design tool.

11. The method ~~as claimed in one of claims 7 to 10, characterized in that~~according to claim 7, further comprising exporting data with a defined format ~~is exported~~ from the ~~at least one~~ software program product~~, in particular~~ or tool into a device ~~as claimed in one of claims 1 to 5~~.according to claim 1.

12. The method ~~as claimed in claim 11, characterized in that~~according to claim 11, further comprising converting the data with a defined format ~~is converted~~ into project data and/or project planning data ~~with~~having a proprietary format.

IPE
FEB 2 8 2002
PATENT & TRADEMARK OFFICE
JC53

BAKER BOTTS L.L.P.

30 ROCKEFELLER PLAZA

NEW YORK, NEW YORK 10112

TO ALL WHOM IT MAY CONCERN:

Be it known that WE, Jürgen Büssert and Peter Wagner, citizens of Germany, whose post office addresses are Krumme, Leithe 3, 91338 Igensdorf, Germany; and Kellerstr. 7, 91217 Hersbruck, Germany; respectively, have made an invention in:

PROVISION OF PROJECT AND/OR PROJECT PLANNING DATA OF AN AUTOMATION PROJECT IN A FORMAT WHICH IS DEFINED BY A STANDARDIZED META LANGUAGE, IN PARTICULAR XML

of which the following is a

SPECIFICATION

FIELD OF THE INVENTION

[0001] The invention relates to a device for providing project and/or project planning data of an automation project in a format which is defined by a standardized meta language, in particular XML. Furthermore, the present invention relates to a corresponding engineering system and corresponding method for providing project data and/or project planning data.

BACKGROUND OF THE INVENTION

[0002] Programmable control systems generally contain what is referred to as a run-time system for controlling the sequencing over time of automation components, including a

machine or a system, and what is referred to as an engineering system for editing, generating and/or modifying control programs. The project data and/or project planning data which is generated in and with the engineering system ~~and has~~, including a proprietary format, is transferred into the run-time system and used there for outputting the control variables.

[0003] As the complexity of programmable control systems and of automation components increases and as the complexity of the objectives to be fulfilled by these systems and components increases, the control programs required are also becoming more and more complex. One ~~of the~~ possible ~~ways~~method of countering these increasing ~~requirements~~complexities would be to increase further the functionality of the previous engineering systems. However, this has the disadvantage that the engineering systems themselves become more and more complex and thus more costly in terms of their programming and further development.

~~[0004] The object of the present invention is therefore to facilitate and improve the development of control programs without the aforesaid disadvantages.~~

SUMMARY OF THE INVENTION

[0004] ~~[0005]~~ The object of the present invention is therefore to facilitate and improve the development of control programs without the aforesaid disadvantages. According to the invention, this object is achieved by means of a device for providing project data and/or project planning data of an automation project which contains a converting apparatus for converting project data and/or project planning data ~~with~~having a

proprietary format into data with a format which is defined by a standardized meta language, in particular XML, and for converting ~~back data with a format which is~~said defined ~~by a standardized meta language, in particular XML,~~format into project data and/or project planning data ~~with a proprietary format and for providing~~into the ~~data with a defined~~proprietary format for further processing. This object is further ~~Furthermore, the aforesaid object is~~ achieved by means of a corresponding engineering system and corresponding methods.

~~[0006] Furthermore, the aforesaid object is achieved by means of a corresponding engineering system and corresponding methods.~~

~~[0007] Advantageous further developments of the device according to the invention and of the method according to the invention are the subject matter of the subclaims.~~

[0005] ~~[0008] A particular advantage of the device according to the~~In a preferred embodiment of the present invention, ~~of the engineering system according to the invention and of the methods according to the invention is that, by converting~~ project data and/or project planning data of an automation project ~~with~~having a proprietary format is converted into data with a format which is defined by a standardized meta language, in particular XML, ~~and by providing this data with a~~. Data in the defined format, ~~firstly~~ is provided to an external computer program products or tools which map onto ~~the~~this data ~~generated in this way with a defined format~~, and which can read ~~-~~in, ~~analyse~~analyze, display and/or process this data without the ~~project data and/or project planning~~ data having to be converted, for each computer program product or tool, into a format which can be read and/or processed by the computer program product or tool. By

converting data with a defined format into data with a proprietary format, data generated by external computer program products or tools can be made available to the automation project. The generation and modification of control programs can be considerably simplified and speeded up by means of the present invention.

[0006] ~~[0009]~~ The term "meta language" ~~stands for the definition or description of~~means a language. ~~The~~More specifically, the meta language describes the rules for generating a language. The "Standard Generalized Markup Language" (SGML), for example, is referred to as a meta language because it constitutes a language for describing languages. It defines the rules defining how a document can be written in its logical structure (headings, paragraphs, content units etc). XML (extensible markup language) is~~, as~~ a subset of SGML, ~~also~~and therefore a meta language for defining document types. With a meta language, such as SGML or XML, it is possible to ~~product~~produce documents which all follow the same basic patterns in terms of their structure. For the sake of simplicity, the present invention is described below solely with reference to XML.

~~[0010] The invention will be described below with reference to XML solely for the purpose of simplifying the representation and explanation of the invention.~~

[0007] ~~[0011]~~ A significant advantage of XML is that a strict distinction is made between the content, representation and structure of data. This is achieved by means of the possibility of defining tags in XML files, which tags can in turn contain other tags. As a result, an XML file can set up a tree which leads to a structured distinction between different contents. This ensures the basis for machine processing of the file.

[0008] ~~[0012]~~ An XML document can assume different representations using different XSL files (XSL = extensible stylesheet language). XSLT (XSLT = extensible stylesheet language for transformations) is used for converting from one XML document into another. Application areas for XSLT may be the conversion of XML files into HTML (hypertext markup language) or XHTML (extensible hypertext markup language), but also into free formats.

[0009] ~~[0013]~~ The device ~~according to~~ in accordance with the invention ~~advantageously~~preferably has an export/import apparatus for exporting/importing data from and into the device ~~and into it~~. In this way, direct exporting/importing of the data into and from the external software product ~~or~~, products, or tools is possible~~,~~. This feature further ~~simplifying~~simplifies the handling of the data.

[0010] ~~[0014]~~ ~~According to one advantageous development,~~another preferred embodiment of the device according to the present invention ~~can have~~, a data storage apparatus is provided for storing ~~the~~ data with a defined format. If the data with a defined format is stored in a data storage apparatus, the project data and/or project planning data do not need to be converted again into data with a defined format for each exporting process. The data storage apparatus can thus be used to make available the data with the format defined by the standardized meta language for an external software program product or tool without appreciable time delay.

[0011] ~~[0015]~~ Examples of software program products or tools which can image data ~~which has~~in a format which is defined by a standardized meta language, in particular XML, are:

- Version administration programs such as can be obtained under the trade names "ClearCase" or "PVCS"~~, for example~~;
- CAD, CAM, CAE programs (CAD = computer aided design, CAM = computer aided manufacturing, CAE = computer aided engineering);
- Cam disk programs;
- Productivity tools which can generate parts of project data and/or project planning data; and
- Project design tools (Sizer), for supporting the generation or duplication of project data and/or project planning data.

[0012] ~~[0016]~~ The project data and/or project planning data can be exported, as data with a defined format, from the automation project and read into the software program products or tools by means of the export/import apparatus of the device ~~according to the invention~~ and/or the engineering system according to the invention. The software program products or tools can then analyze, evaluate, display and/or process this data. It is possible to provide ~~here for~~ only those elements which are known to the reading-in software program product or the tool to be analyzed, evaluated, displayed and/or processed by the software program product. Unknown parts are ignored by the software program product or tool in this case. If data is absent in the structure, it can be ~~occupied~~filled with standard initial values. Contents of a data record which have remained the same can also be transferred by means of different data structure versions using the data which can be generated using the standardized meta languages, in particular XML, ~~and~~which has a strictly hierarchical structure.

[0013] ~~[0017]~~ The software program products or tools which can process the project data and/or project planning data with a defined format, ~~for example~~i.e., cam disk programs, project design programs, and productivity tools, can transmit back the changed or modified data with a defined format to the automation project, in particular by means of the export/import apparatus, after the processing of the data with a defined format. During importing, the data with the defined format is converted into data with a proprietary format using the conversion apparatus. This data can then be transmitted, possibly after further processing, by the automation project or the engineering system in a form which is suitable for the run-time system.

~~[0018] This data can then be transmitted, possibly after further processing, by the automation project or the engineering system in a form which is suitable for the run-time system.~~

[0014] ~~[0019]~~ For practical reasons ~~of practicability~~, it is ~~advantageously possible to provide~~preferred for the conversion apparatus and the export/import apparatus to be embodied as one apparatus. In this case, the export/import apparatus would simultaneously have the functionality of the conversion apparatus or the conversion apparatus, would simultaneously be capable of exporting data from the automation project or importing it into it.

[0015] ~~[0020] The~~Thus, the present invention ~~thus~~ makes it possible to convert project and/or project planning data which is present in an automation project ~~and has~~in a proprietary format into data with a format which is defined by a standardized meta language, in particular XML~~,~~; and to export it from an automation project, or import it

into software program products or tools, process it there, transmit back the processed data with a defined format into the automation project, and convert it into data with a proprietary format, and thus make it available to the automation project or engineering system as project data and/or project planning data.

~~[0021] According to a further method according to the invention, project data and/or~~ project planning data of ~~an automation~~ project or of ~~a~~ component ~~can be generated by virtue of the fact that at least one computer program product or tool generates project data and/or~~ project ~~planning data or is generated thereby~~ ~~and this data is~~ provided ~~in~~ a format ~~defined by means of a standardized meta~~ language, ~~in particular XML,~~ for further processing. ~~The data with a defined format can then be imported into an automation project and converted into a proprietary data format there.~~

[0016] ~~[0022]~~ In a further embodiment of the method according to the present~~According to a further method according to the~~ invention, project data and/or project planning data of an automation project or of a component can be generated by virtue of the fact that at least one computer program product or tool generates project data and/or project planning data ~~or is generated thereby~~, or is generated thereby, and this data is provided in a format defined by means of a standardized meta ~~language, in particular XML,~~ language for further processing. The data with a defined format can then be imported into an automation project and converted into a proprietary data format there. In this way, a complete record of project data and/or project planning data for an automation project can also be produced there using external computer program products or tools. For this purpose, the data required for this is generated by the at least one external computer

program product or tool as data with a defined format, or converted into such data, and subsequently made available for further processing. After or during the importing of data with a defined format into the automation project, the data is then converted into data with a proprietary format.

[0017] ~~[0023]~~ Changes or improvements to the record of project data and/or project planning data generated in this way can then be attempted and/or carried out by means of at least one application of the method according to the invention or by means of at least one varying repetition of the second method according to the invention. The method(s)~~The methods~~ according to the invention can be applied repeatedly until an optimum record of project data and/or project planning data has been generated or found for the given automation project.

~~[0024] The methods according to the invention can be applied repeatedly until an optimum record of project data and/or project planning data has been generated or found for the given automation project.~~

[0018] ~~[0025]~~ A further advantage of the present invention is that, on the basis of the mechanisms described, for example changes of project data and/or project planning data by comparison with project data and/or project planning data which has been produced earlier or later, it is possible to detect and evaluate very easily whether this data is respectively present with a format which is defined by a standardized meta language~~, in particular XML~~. Using data which is structured in this way, it is possible to process differences between various versions of project data and/or project planning data with very high resolution~~, which~~This is particularly advantageous ~~in particular~~ for methods

and processes ~~whose~~the sequence of which must be precisely defined and capable of being followed. Thus, the present invention can more easily take into account, for example, the regulations of the US Food and Drug Administration (FDA) and the "Change Control" regulations prescribed by the FDA.

~~[0026] A further advantage of the provision of project data and/or project planning data is that if the data is present, for example, in XML format, the data with XML format~~ can ~~be converted into files with practically any desired format using XSLT. It is thus possible, for example,~~ to convert at least some of the data ~~from an XML file into an HTML document by means of XSLT instructions. Such an HTML document can then be viewed, for example,~~ with one of the known browsers. To do this, the HTML document ~~can also be loaded and represented, for example, by means of an external computer via the Internet.~~

[0019] ~~[0027] A further advantage of providing~~A ~~further advantage of the provision of~~ project data and/or project planning data ~~is that if the data is present, for example, in XML format, the data with XML format~~in, for example XML format, is that the data can be converted into files with practically any desired format using XSLT. It is thus possible, for example, to convert at least some of the data from an XML file into an HTML document by means of XSLT instructions. Such an HTML document can then be viewed~~, for example,~~ with one of the known browsers. To do this, the HTML document can also be loaded and represented~~, for example,~~ by means of an external computer via the Internet. In addition to the display of at least some of the project data and/or project planning data by means of conversion~~, for example~~ into HTML files, it is ~~advantageously~~

possible to use XSLT also to generate files in any desired format from the data with XML format. Such files can then be read ~~-~~in and/or processed~~, for example,~~ by a software program product, and used to generate ~~a~~ documentation for an automation project. The documentation of the respectively executed changes in an automation project is also made easier by means of the present invention.

[0020] ~~[0028]~~ The present invention thus makes it possible to use a multiplicity of external software program products or tools for the development and supervision of control programs ~~whose~~in which respective functionalities do not need to be integrated into the engineering system. The possibility of the use and the integration of external software program products or tools for the development and supervision of control programs makes it possible, on the one hand, to avoid a situation in which the engineering system is "overloaded" with functionalities, and on the other hand it is possible to re-use ~~again~~ the software program products or tools which respectively appear the most suitable for each automation project.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] ~~[0029]~~ The present invention ~~will now be~~is explained in ~~more~~greater detail below with reference to the ~~appended~~ drawings, in which:

~~Fig. 1 shows~~Figure 1 illustrates a diagram illustrating the invention; and

~~Fig 2 shows~~Figure 2 illustrates a view of the file structure of the exported data with a format defined here by XML.

~~[0030] The following exemplary embodiment serves only for a more detailed explanation of the present invention.~~

~~[0031] Fig. 1 represents a schematic view of the invention for providing project data and/or project planning data of an engineering system in the XML format.~~

DETAILED DESCRIPTION OF THE INVENTION

[0022] ~~[0032] Figure 1 illustrates~~~~Fig. 1 represents~~ a schematic view of the invention for providing project data and/or project planning data of an engineering system in the XML format. Project data and/or project planning data for the open-~~-~~loop or closed-loop control of a programmable control system is generated in an engineering system 1. This data, which is present in a proprietary data format, is stored in an internal data ~~store 3 in the present example.~~storage means 3.

[0023] ~~[0033]~~ The engineering system also contains a conversion and export/import apparatus (not shown ~~here~~). For practical reasons ~~of practicability, there may be provision for~~ the ~~functionalities~~functions of both apparatuses ~~to~~may be implemented in a single apparatus. During exporting, ~~these apparatuses convert the~~ data with a proprietary format is converted into data with an XML format~~,~~; and during importing, ~~these apparatuses convert~~ the data with XML format may be converted into data with a proprietary format. ~~This~~The data with XML format is stored in a data ~~store 5 in the present example.~~storage means 5.

[0024] ~~[0034]~~ The data with XML format can then be read ~~-~~in, evaluated and processed by software program products or tools 7 which map onto XML. Using suitable software program products or tools, new data or changed data with XML format can thus also be generated. This data, for example a machine image, can then be converted into data with

a proprietary format and read back into the engineering system and used there for the development or improvement of a control program.

[0025] ~~[0035]~~ In ~~the present example,~~Figure 1, the data which can be processed is written back into the data ~~store~~storage means for the data with XML format by the software program products or tools, and/or read ~~-~~in from the data ~~store~~storage means by the engineering system. However, other solutions in which the importing/exporting of the data is carried out in some other way, and/or by means of other apparatuses, are, of course, also conceivable within the scope of the present invention.

[0026] ~~[0036]~~ Using XSLT instructions 9, it is also possible to convert the data with XML format into files with virtually any desired format. These files, which can then have~~, for example,~~ HTML format, or a proprietary format, can then be used ~~to~~in display 11, for example, using a browser~~,~~ to generate technical documentation ~~13~~13, or generate documentation for recording and supervisory purposes 15.

[0027] ~~[0037]~~ The separation~~, represented here graphically,~~ between the software program products or tools 7 and the displays 11 or documentation 11 and 13 ~~serves~~is only ~~for the sake of~~an illustration. ~~Of course, it~~It is conceivable for the conversion of the XML files by means of XSLT also to be performed by at least one of the software program products or tools, and also for the display 11 and/or the production of the documentation 13, 15 to be performed by these products or tools. ~~It~~Thus it is ~~thus conceivable~~possible, for example, for a version administration program to simultaneously produce documentation 15 relating to the changes which have taken place in an automation project.

~~[0038] Fig. 2 shows a view of the file structure of the exported data such as is generated in the SIMOTION SCOUT system generated by the applicant.~~

[0028] ~~[0039]~~ Figure 2 illustrates~~Fig. 2 shows~~ a view of the file structure of the exported data such as is generated in the SIMOTION SCOUT system generated by the applicant. An exported SIMOTION SCOUT automation project is stored in a file structure. This structure is based on the design of an automation project in the SIMOTION SCOUT project navigator.

[0029] ~~[0040]~~ The large set of data of an automation project is stored in the divided-up data blocks. This permits manageable data, which still appears logical to the user after exporting. Another aspect of such a hierarchy is the possibility of analyzing components of an automation project or transmitting them over the Internet without disrupting the unimportant data.

[0030] ~~[0041]~~ The hierarchy of the data with XML format such as is generated in the case of SIMOTION SCOUT ~~will be~~is explained below as a possible example of the hierarchy of the data with XML format:

Folder:	MyProjectDataFolder
	Project.xml
Folder:	Project
	Project.xml
	Alarms.xml
	Installation.xml
	ReferenceTable.xml
	S7ProjectData.xml
Folder:	Device

	Device.xml
	RunTimeLevels.xml
	DeviceData.xml
	Device_Symbols.xml
Folder:	ProcessingUnit
	ProcessingUnit.xml
	SCL-Programm.xml
Folder:	TOCamType
	TOCamType.xml
	Camdisk.xml
Folder:	TOPosAxis
	TOPosAxis.xml
Folder:	PositioningAxis
	PositioningAxis.xml
	ExpertList.xml

[0031] ~~[0042]~~ Different XML files are created in the hierarchy. Files can exclusively contain links or exclusively contain data. The files which contain links are located in a folder of the same name and the files which make it possible to enter this folder. The links which are contained in the files refer to XML files which are responsible for the data storage and are located in the same folder. In addition, the links can also refer to the entry files of the subfolders. This principle simplifies portability. This ensures that a folder can removed from the hierarchy without the structure being lost. In this way, relevant data can be passed onto third parties without also supplying unnecessary files.

We Claim:

1. A device for ~~providing project data and/or project planning data of~~converting data from a proprietary format in an automation project or component~~, characterized~~ to a format defined by a standardized meta format, comprising a conversion apparatus, and further comprising means for converting the data with a defined format into project data and/or project planning data with a proprietary format ~~into data with a format which is defined by a standardized meta language~~, ~~in particular XML,~~ and ~~for converting back data with a format which is defined by a standardized meta language, in particular XML, into project data and/or project planning data with a proprietary format and~~means for providing the data with a defined format for further processing.

2. The device ~~as claimed in~~according to claim 1, ~~characterized in that it contains~~further comprising an export/import apparatus ~~for exporting/importing data from the device and into it, respectively~~.

3. The device ~~as claimed in one of claims 1 or 2, characterized in that~~according to claim 2, wherein the conversion device and the export/import apparatus are embodied ~~as one~~in a single apparatus.

4. The device ~~as claimed in one of the preceding claims, characterized by~~according to claim 1, further comprising a data storage apparatus for storing the data with a defined format.

5. An engineering system ~~having~~comprising ~~a~~the device ~~as claimed in one of claims 1~~according to ~~4.~~claim 1.

6. A method for providing project data and/or project planning data ~~of~~from an automation project or component, ~~characterized in that~~comprising converting the project data and/or project planning data ~~with~~having a proprietary format ~~is converted~~ into data with a format which is defined by a standardized meta language~~, in particular XML,~~ and which is made available for further processing.

7. The method ~~as claimed in~~according to claim 6, ~~characterized~~ further comprising reading ~~in~~ ~~that~~and processing the data with a defined format ~~is read in and processed~~ by at least one software program product or tool.

8. A method for providing project data and/or project planning data ~~of~~from an automation project or component, ~~characterized in that at least one computer program product or tool generates project data and/or project planning data or such data is generated~~comprising generating by means of ~~said~~ at least one computer program product or tool data in a proprietary format, and making this data ~~is made~~ available for further processing in a format which is defined by a standardized meta language~~, in particular XML~~.

9. The method ~~as claimed in one of~~according to claims 6 ~~to~~and 8, ~~characterized in that~~further comprising storing data ~~with~~having a defined format ~~is stored~~ in a data storage apparatus.

10. The method ~~as claimed in one of claims 7 to 9, characterized in that~~according to claim 7, wherein the ~~at least one~~ software program product or tool is selected from a version administration tool, a CAD, CAM, CAE program, a cam disk tool, a productivity program or a project design tool.

11. The method ~~as claimed in one of claims 7 to 10, characterized in that~~according to claim 7, further comprising exporting data with a defined format ~~is exported~~ from the ~~at least one~~ software program product~~, in particular~~ or tool into a device ~~as claimed in one of claims 1 to 5~~.according to claim 1.

12. The method ~~as claimed in claim 11, characterized in that~~according to claim 11, further comprising converting the data with a defined format ~~is converted~~ into project data and/or project planning data ~~with~~having a proprietary format.

Abstract

~~Provision of project and/or project planning data of an automation project in a format which is defined by a standardized meta language, in particular XML.~~

The invention relates to a device, an engineering system and method for providing project data and/or project planning data of an automation project or of a component in a format which is defined by a standardized meta language, in particular XML. By converting project data and/or project planning data with a proprietary format into data with a format which is defined by a standardized meta language, in particular XML, and by providing this data with a defined format, external computer program products or tools which map onto data with the defined format can read in, analyze, display and/or process this data without having to convert the project data and/or project planning data into a format which the respective computer program product or tool can read or process. By converting data with a defined format into data with a proprietary format, it is possible to make available data generated by external computer program products or tools to the automation project. As a result, the generation and modification of control programs can be considerably simplified and speeded up.

~~(fig. 1)~~